

Appl. No. 10/706,767

134166-1

Amdt. Dated November 8, 2004

Reply to Office action of August 16, 2004

**Specification:**

[0045] In another aspect, a gas sensor device is arranged within an encapsulation in a flip-chip arrangement. In a flip-chip arrangement, the gas sensor device is flipped upside down, such that all of the top surface areas of the device including the metal contacts, and the area surrounding the sensitive area of the device where the catalyst layers are placed, are protected from the gases to be monitored. An additional protective board protects the back surface of the chip. Directly over the sensitive area of the device, a slit, or opening in the ceramic board to which the chip's top surface is mounted, is created to allow the gases to flow to the catalyst for sensing. [.] A layer of a high temperature stable conductive material, such as platinum or gold, may be used to interconnect the components of the gas sensor device to leads in the encapsulation layer. This flip-chip arrangement enables interconnect in a higher vibration and higher temperature, for example greater than 500 °C, environment than conventional wire bonds, which are susceptible to fatigue failure. The interconnection using platinum and/or gold "bumps" to connect the components, such as the one or more ohmic contacts and/or the one or more catalytic gate-electrodes, of the gas sensor device to the leads helps to enable the use of the gas sensor device in the harsh environments.